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| 10/009,690 | 03/12/2002 | Inge Johansen | 2001_1827A | 1301 |
| 513 | 7590 | 04/28/2004 | EXAMINER | |
| WENDEROTH, LIND & PONACK, L.L.P. | | | KERNS, KEVIN P | |
| 2033 K STREET N. W. | | | ART UNIT | |
| SUITE 800 | | | PAPER NUMBER | |
| WASHINGTON, DC 20006-1021 | | | 1725 | |

DATE MAILED: 04/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AG

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/009,690 | Applicant(s) JOHANSEN ET AL. | |
| | Examiner Kevin P. Kerns | Art Unit 1725 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-18 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 14 is objected to because of the following informalities: in line 11 of claim 14, "transport" should be changed to "transfer" before "through" for consistency.

Appropriate correction is required.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 9-12 and 14-17 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 11, 17, and 23-28 of copending Application No. 10/018,174. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims share identical elements (steel mold housing having a plurality of channels, permeable wall material, at least one annular slit/nozzle, and a thermally insulating plate provided

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with through holes and a protrusion), with the exception of the functional limitations of primary and secondary cooling provided in 10/009,690. One of ordinary skill in the art would have recognized that the structures provided in claims 11, 17, and 23-28 of 10/018,174 would clearly be able to provide increased/decreased cooling to the metal being cast, corresponding to claims 9-12 and 14-17 of the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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6. Claims 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dantzig et al. (US 4,523,624) in view of Naess, Jr. et al. (EP 0 337 769).

Dantzig et al. disclose a horizontal casting apparatus for casting round ingots of aluminum, steel, and other metals, in which the apparatus includes a liquid metal reservoir 22, a releasable, circular mold 12 (steel is disclosed as one material for the mold) having a mold cavity, a valved lubricant (oil, graphite etc.) supply system (50,51,52,54,56) for providing a first (primary/secondary) cooling, and a cooling (preferably water) manifold arranged circumferentially around the outer mold wall 16, such that a second (primary/secondary) cooling (through slits) is controlled by a valving arrangement 48 (abstract; column 3, lines 25-68; column 4, lines 1-53; and Figures 1 and 2). Dantzig et al. do not specifically disclose a permeable wall material (for supply of oil and/or gas) along the interior wall of the mold housing, a protrusion extending along the permeable wall material, and the multiple housing structures.

However, Naess, Jr. et al. disclose a horizontal continuous casting apparatus for casting aluminum and other metals, in which the apparatus includes a mold cavity 4 provided with a permeable ring 20 for the supply of oil and/or gas via gas bore 21 and oil bore 22, an inwardly protruding projection 15 extending along the surface of the permeable wall material (permeable ring 20 (held by tongue 27 and groove 26), which is provided along the interior wall of the mold cavity 4), first housing structure 11 contacting permeable ring 20, second housing part 5, and aluminum/steel sleeve 12 serving as a thermally insulating annular plate that includes the protruding projection 15 at its bottom side, with the sleeve held in by bolts to allow for removal/exchange with

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other sleeves of different sizes, and a cooling water supply 29-32 (abstract; column 1, lines 3-15 and 53-63; column 2, lines 1-10 and 28-63; column 3, lines 1-65; column 4, lines 1-52; and Figures 1-6). These features are advantageous for providing controlled, uniform cooling of one or more molds of selectively different shapes and sizes by providing oil and/or gas through the permeable material (abstract; column 1, lines 3-15; column 3, lines 15-19; and column 4, lines 47-52).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the horizontal casting apparatus disclosed by Dantzig et al., by adding the permeable wall material along the interior wall of the mold housing, a protrusion extending along the permeable wall material, and the multiple housing structures, all of which are taught by Naess, Jr. et al., in order to provide controlled, uniform cooling of one or more molds of selectively different shapes and sizes by providing oil and/or gas through the permeable material (Naess, Jr. et al.; abstract; column 1, lines 3-15; column 3, lines 15-19; and column 4, lines 47-52).

7. Claims 9, 11, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dantzig et al. (US 4,523,624) in view of Sokolowski (US 4,501,317).

Dantzig et al. disclose a horizontal casting apparatus for casting round ingots of aluminum, steel, and other metals, in which the apparatus includes a liquid metal reservoir 22, a releasable, circular mold 12 (steel is disclosed as one material for the mold) having a mold cavity, a valved lubricant (oil, graphite etc.) supply system (50,51,52,54,56) for providing a first (primary/secondary) cooling, and a cooling

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(preferably water) manifold arranged circumferentially around the outer mold wall 16, such that a second (primary/secondary) cooling (through slits) is controlled by a valving arrangement 48 (abstract; column 3, lines 25-68; column 4, lines 1-53; and Figures 1 and 2). Dantzig et al. do not specifically disclose a permeable wall material (for supply of oil and/or gas) along the interior wall of the mold housing.

However, Sokolowski discloses a horizontal casting system having lubricated casting nozzles, in which the system includes a porous gasket 74 (permeable wall material for controlling flow of lubricant) provided along the interior wall of the mold housing, for the purpose of providing a continuous supply of lubricant to the mold (abstract; column 2, lines 43-68; column 3, lines 1-12 and 21-25; column 4, lines 30-68; column 5, lines 1-68; column 6, lines 1-43; and Figures 3-5).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the horizontal casting apparatus disclosed by Dantzig et al., by adding the permeable wall material in the form of a porous gasket along the interior wall of the mold housing, as taught by Sokolowski, in order to provide a continuous supply of lubricant to the mold (Sokolowski; abstract; column 3, lines 1-12 and 21-25; column 4, lines 61-68; and column 5, lines 42-52).

8. Claims 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai et al. (US 5,205,344) in view of Naess, Jr. et al. (EP 0 337 769).

Nagai et al. disclose a horizontal continuous casting device, in which the device includes a tundish 1 containing molten metal 10 to flow through insulating orifice plate 2

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into a mold cavity provided in a mold 3 removably connected to the reservoir 1, such that the mold housing includes a plurality of channels serving as (nozzle) outlets for supply of lubricating oil 5 and water 8 (providing primary and secondary cooling), with an annular slit (annular gap 7) being provided around the circumference of the mold cavity (abstract; column 1, lines 43-68; column 2, lines 1-52; column 3, lines 4-38; column 4, lines 1-16; and Figures 1-5). Nagai et al. do not disclose a permeable wall material (for supply of oil and/or gas) along the interior wall of the mold housing.

However, Naess, Jr. et al. disclose a horizontal continuous casting apparatus for casting aluminum and other metals, in which the apparatus includes a mold cavity 4 provided with a permeable ring 20 for the supply of oil and/or gas via gas bore 21 and oil bore 22, an inwardly protruding projection 15 extending along the surface of the permeable wall material (permeable ring 20 (held by tongue 27 and groove 26), which is provided along the interior wall of the mold cavity 4), first housing structure 11 contacting permeable ring 20, second housing part 5, and aluminum/steel sleeve 12 serving as a thermally insulating annular plate that includes the protruding projection 15 at its bottom side, with the sleeve held in by bolts to allow for removal/exchange with other sleeves of different sizes, and a cooling water supply 29-32 (abstract; column 1, lines 3-15 and 53-63; column 2, lines 1-10 and 28-63; column 3, lines 1-65; column 4, lines 1-52; and Figures 1-6). These features are advantageous for providing controlled, uniform cooling of one or more molds of selectively different shapes and sizes by providing oil and/or gas through the permeable material (abstract; column 1, lines 3-15; column 3, lines 15-19; and column 4, lines 47-52).

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It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the horizontal continuous casting device disclosed by Nagai et al., by adding the permeable wall material along the interior wall of the mold housing, a protrusion extending along the permeable wall material, and the multiple housing structures, all of which are taught by Naess, Jr. et al., in order to provide controlled, uniform cooling of one or more molds of selectively different shapes and sizes by providing oil and/or gas through the permeable material (Naess, Jr. et al.; abstract; column 1, lines 3-15; column 3, lines 15-19; and column 4, lines 47-52).

9. Claims 9, 11, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai et al. (US 5,205,344) in view of Sokolowski (US 4,501,317).

Nagai et al. disclose a horizontal continuous casting device, in which the device includes a tundish 1 containing molten metal 10 to flow through insulating orifice plate 2 into a mold cavity provided in a mold 3 removably connected to the reservoir 1, such that the mold housing includes a plurality of channels serving as (nozzle) outlets for supply of lubricating oil 5 and water 8 (providing primary and secondary cooling), with an annular slit (annular gap 7) being provided around the circumference of the mold cavity (abstract; column 1, lines 43-68; column 2, lines 1-52; column 3, lines 4-38; column 4, lines 1-16; and Figures 1-5). Nagai et al. do not disclose a permeable wall material (for supply of oil and/or gas) along the interior wall of the mold housing.

However, Sokolowski discloses a horizontal casting system having lubricated casting nozzles, in which the system includes a porous gasket 74 (permeable wall

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material for controlling flow of lubricant) provided along the interior wall of the mold housing, for the purpose of providing a continuous supply of lubricant to the mold (abstract; column 2, lines 43-68; column 3, lines 1-12 and 21-25; column 4, lines 30-68; column 5, lines 1-68; column 6, lines 1-43; and Figures 3-5).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the horizontal continuous casting device disclosed by Nagai et al., by adding the permeable wall material in the form of a porous gasket along the interior wall of the mold housing, as taught by Sokolowski, in order to provide a continuous supply of lubricant to the mold (Sokolowski; abstract; column 3, lines 1-12 and 21-25; column 4, lines 61-68; and column 5, lines 42-52).

10. Claims 9-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kittilsen et al. (US 5,915,455).

Kittilsen et al. disclose an apparatus for horizontal casting of light metals, in which the apparatus includes a tundish 3 with a first insulating plate 29 for supplying molten metal M that flows into a steel pipe 28 and into a mold 10, such that the mold 10 has multiple housings (including a first mold housing having a plurality of channels); a second mold housing 26; a thermally insulating annular plate (structures with 21 and 23 written thereon) arranged against the first mold housing; an oil ring 19 with oil supply channels 20 to lubricate the mold; a transition ring of insulating porous refractory material 21 to provide heat transfer via oil (from oil ring 19 and oil supply channels 20) and gas from gas supply channels 22 to the interior wall of the mold housing (in the

vicinity of metal solidification region 25 and to the left of mold depth parameters L1 and L2); and separate primary and secondary cooling water circuits (11,12) for flow of coolant around the circumference of the mold cavity (abstract; column 1, lines 55-67; column 2, lines 1-44; column 3, lines 7-67; column 4, lines 1-67; column 5, lines 1-3; and Figures 1 and 2). One of ordinary skill in the art would have recognized that (in addition to the conventional types of mold material -- e.g. aluminum, copper, steel etc.), although the primary cooling is not specifically controlled by valve means, the removal and/or exchanges of several molds having various geometries (having dimensions with protrusions, leading to variance in the coolant flow rates through the annular slits/nozzles) were made (easily replaceable) by Kittilsen et al. (in Tables I and II), for the purpose of producing ingots at adequate casting speed with good surface quality (Kittilsen et al.; column 3, lines 50-67; column 4, lines 1-27; and column 5, lines 20-41).

Response to Arguments

11. The examiner acknowledges the applicants' amendment provided with the request for continued examination, received by the USPTO on March 19, 2004. The applicants have overcome prior objections to the specification with the filing of a substitute specification. An objection to claim 14 has been raised by the amendment (see paragraph 1 above). Double patenting rejections have been expanded to include more claims, due to addition of new claims to the related application (see paragraph 3 above). The applicants' amendment overcomes prior rejections under 35 USC 102(b), and all rejections based on the Steen et al. reference have also been overcome in view

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of the applicants' remarks. However, several new rejections under 35 USC 103(a) are included in above paragraphs 6-9, in addition to the further (underlined) details in the rejection based on Kittilsen et al. in above paragraph 10. Claims 9-18 remain under consideration in the application.

12. Applicants' arguments with respect to claims 9-18 have been considered but are moot in view of the new ground(s) of rejection. The applicants are referred to the newly underlined sections in paragraph 10 above in response to their remarks regarding the Kittilsen et al. reference, as further details are provided in the newly underlined sections. The examiner respectfully disagrees with the applicants' assertion that Kittilsen et al. do not disclose and/or suggest the claim limitations per their remarks on page 10 of their response, as the "hot top" is clearly a part of the mold and along the interior of the mold housing, with this structure including the porous refractory material through which oil and/or gas is provided.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kevin Kerns*
Examiner
Art Unit 1725

KPK
kpk
April 24, 2004